Penalties on a Segment of Cities

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	1024 mebibytes

There are n cities. For each city i, we assign a value and pay the price: either the value is 0 and we pay p_i coins, or the value is 1 and we pay q_i coins.

In addition, m constraints are given. A constraint is defined by a segment $[\ell, r]$ and two penalties, a and b. If there is at least one city with value 0 among the cities from ℓ to r, inclusive, we pay a penalty of a coins. If there is at least one city with value 1 among them, we pay a penalty of b coins. The two penalties are independent: if both 0 and 1 are present, we pay $a + b$ coins.

Find the minimum total cost (prices plus penalties) among all ways to choose values for the cities.

Input

The first line contains an integer t: the number of test cases.

The first line of each test case contains two integers n and m ($1 \le n, m \le 2 \cdot 10^5$).

Each of the next n lines contains two integers p_i and q_i ($1 \le p_i, q_i \le 10^9$): the costs of choosing 0 and 1 for city i, respectively.

Each of the next m lines contains four integers ℓ, r, a, b ($1 \le \ell \le r \le n$, $1 \le a, b \le 10^9$): the parameters of a constraint.

The sum of n over all test cases does not exceed $2 \cdot 10^5$.

The sum of m over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output one integer: the minimum total cost.

Example

standard input	*standard output*
2 3 2 1 5 5 1 3 3 1 3 10 10 2 2 100 1 1 1 7 8 1 1 1 1	20 8